

CLAIMS

1. A vibrator having a vibratable core and a sheath of relatively soft material, said sheath having a plurality of apertures formed therein and extending from the external surface thereof through to the core, and said sheath further having
5 projecting portions upstanding from said external surface and facing in the direction of vibration.
2. A vibrator as claimed in claim 1, wherein at least some of said apertures are elongated with lengthwise leading and trailing edges aligned with the longitudinal axis of said vibrator, and wherein said trailing edges are exposed to provide wall
10 portions facing in the direction of vibration.
3. A vibrator as claimed in claim 2, wherein the leading edges of said at least some apertures are cut away to merge into the external surface of the vibrator.
4. A vibrator as claimed in claim 3, wherein the cut away leading edges of the apertures merge with the external surface of the vibrator at a chord angle.
- 15 5. A vibrator as claimed in claim 2, wherein said vibrator is generally cylindrical in shape and the apertures are arranged in groups around the cylindrical periphery with apertures in each group longitudinally aligned in the axial direction of said vibrator.
6. A vibrator as claimed in claim 1, wherein said vibrator has a leading
20 end portion, a trailing end portion and a generally cylindrical body portion intermediate said leading and trailing end portions, wherein elongated recesses extend lengthwise at least partly along said cylindrical body portion, each said elongated recess having a leading edge and a trailing edge, and wherein said leading edges are cut away to merge with the cylindrical body and thereby expose said trailing edges which present
25 upstanding wall portions facing in the direction of vibration.
7. A vibrator as claimed in claim 6, wherein the apertures are located in the recesses.
8. A vibrator as claimed in claim 7, wherein a plurality of apertures are located in each recess with the apertures in each recess aligned in the longitudinal
30 direction of the cylindrical body portion.
9. A vibrator as claimed in claim 7, wherein said apertures are elongated with lengthwise leading and trailing edges and wherein said leading edges of said apertures are cut away along a chord plane to merge with the vibrator cylindrical body at locations in the lands between adjacent recesses.
- 35 10. A vibrator as claimed in claim 6, wherein the leading end portion of the vibrator is frusto-conical in shape and the trailing end portion is also frusto-conical in shape and wherein elongated recesses are formed lengthwise in at least one of said

leading and trailing end portions.

11. A vibrator as claimed in claim 10, wherein elongated recesses are formed lengthwise in both said leading and trailing end portions.

12. A vibrator as claimed in claim 10, wherein the elongated recesses in at least one of said leading and trailing end portions are tear-shaped and wherein the forward side edge of each tear-shaped recess in the direction of vibration is cut back to merge with the frusto-conical body portion to expose the opposed rearward side edge which thereby presents an upstanding wall portion facing in the direction of vibration.

13. A vibrator as claimed in claim 1, wherein the vibratable core is a metal cylinder having a rotatable shaft extending concentrically therein, and wherein an eccentric weight is rotatable by said shaft to impart oscillatory vibrations to said vibrator.

14. A vibrator having a core surrounded by a sheath, said core being vibratable with an oscillatory motion, wherein a plurality of apertures extend through said sheath to expose portions of said core and wherein the external surface of said sheath is contoured to present wall portions facing in the direction of oscillatory motion.

15. A vibrator having a vibratable core surrounded by a sheath of relatively soft material, said sheath having a plurality of apertures extending therethrough to expose portions of said core, wherein the sheath has a leading end portion, a trailing end portion and an elongated intermediate section, and wherein at least one recess is formed in the external surface of said intermediate section and extends longitudinally therein, said at least one recess having a leading said edge and a trailing side edge with said trailing side edge being exposed to present a wall portion facing in the direction of vibration.

16. A vibrator as claimed in claim 15, wherein a plurality of recesses extend longitudinally at least partly along the external surface of the intermediate section and wherein the apertures are located in the recesses.

17. A vibrator as claimed in claim 16, wherein a plurality of apertures are located in each recess, at least some of said apertures being elongated with lengthwise leading and trailing edges aligned with the longitudinal axis of said vibrator, said trailing edges of said apertures being exposed to provide wall portions facing in the direction of vibration, and wherein the apertures in each recess are aligned in the longitudinal direction of the cylindrical body portion.

18. A vibrator as claimed in claim 16, wherein said apertures are elongated with lengthwise leading and trailing edges and wherein said leading edges of said apertures are cut away along a chord plane to merge with the vibrator cylindrical body

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at locations in the lands between adjacent recesses.

19. A vibrator as claimed in claim 15, wherein the leading end portion of the vibrator is frusto-conical in shape and the trailing end portion is also frusto-conical in shape and wherein elongated recesses are formed lengthwise in at least one of said leading and trailing end portions.

20. A vibrator as claimed in claim 19, wherein elongated recesses are formed lengthwise in both said leading and trailing end portions.

21. A vibrator as claimed in claim 19, wherein the elongated recesses in at least one of said leading and trailing end portions are tear-shaped and wherein the forward side edge of each tear-shaped recess in the direction of vibration is cut back to merge with the frusto-conical body portion to expose the opposed rearward side edge which thereby presents an upstanding wall portion facing in the direction of vibration.

22. A vibrator having an elongated vibratable core surrounded by a sheath of relatively soft material, said sheath having a plurality of apertures extending therethrough to expose portions of said core, wherein at least one of said apertures is elongated and has a lengthwise axis lying substantially parallel to the longitudinal axis of said vibrator, and wherein said at least one aperture has a leading side edge and a trailing side edge with respect to the direction of vibration, said trailing edge being of greater height than said leading edge to present an upstanding wall portion.

23. A vibrator as claimed in claim 22, wherein the leading edge of said at least one aperture is cut away to merge into the external surface of the vibrator.

24. A vibrator as claimed in claim 23, wherein the cut away leading edge of the aperture merges with the external surface of the vibrator at a chord angle.

25. A vibrator as claimed in claim 22, wherein said vibrator is generally cylindrical in shape and a plurality of apertures are arranged in groups around the cylindrical periphery with apertures in each group longitudinally aligned in the axial direction of said vibrator.

26. A vibrator as claimed in claim 22, wherein said vibrator has a leading end portion, a trailing end portion and a generally cylindrical body portion intermediate said leading and trailing end portions, wherein elongated recesses extend lengthwise at least partly along said cylindrical body portion, each said elongated recess having a leading edge and a trailing edge, and wherein said leading edges are cut away to merge with the cylindrical body and thereby expose said trailing edges which present upstanding wall portions facing in the direction of vibration.

27. A vibrator as claimed in claim 26, wherein the apertures are located in the recesses.

28. A vibrator as claimed in claim 27, wherein a plurality of apertures are

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located in each recess with the apertures in each recess aligned in the longitudinal direction of the cylindrical body portion.

29. A vibrator as claimed in claim 27, wherein said leading edges of said apertures are cut away along a chord plane to merge with the vibrator cylindrical body at locations in the lands between adjacent recesses.

30. A vibrator as claimed in claim 26, wherein the leading end portion of the vibrator is frusto-conical in shape and the trailing end portion is also frusto-conical in shape and wherein elongated recesses are formed lengthwise in at least one of said leading and trailing end portions.

31. A vibrator as claimed in claim 30, wherein elongated recesses are formed lengthwise in both said leading and trailing end portions.

32. A vibrator as claimed in claim 30, wherein the elongated recesses in at least one of said leading and trailing end portions are tear-shaped and wherein the forward side edge of each tear-shaped recess in the direction of vibration is cut back to merge with the frusto-conical body portion to expose the opposed rearward side edge which thereby presents an upstanding wall portion facing in the direction of vibration.

~~33.~~ A vibrator having an elongated core vibratable with an oscillatory motion, a sheath surrounding said core and having a frusto-conical leading end portion, a frusto-conical trailing end portion and an elongated generally cylindrical portion intermediate said leading and end portions, a plurality of axially aligned recesses formed in the external surface of said intermediate portion and a plurality of elongated apertures formed in at least some of said recesses with the longitudinal axes of said apertures aligned with the longitudinal axes of said recesses, said apertures extending through said sheath to expose portions of said core, the elongated side edges of said recesses and apertures forming respective leading and trailing edges in the direction of oscillatory vibration and said apertures and recesses being configured such that said trailing side edges stand proud to present upstanding wall portions facing in said direction of oscillatory vibration.

34. A vibrator as claimed in claim 33, wherein the leading edges of said apertures are cut away to merge into the external surface of the vibrator.

35. A vibrator as claimed in claim 34, wherein the cut away leading edges of the apertures merge with the external surface of the vibrator at a chord angle.

36. A vibrator as claimed in claim 32, wherein elongated recesses are formed lengthwise in at least one of said frusto-conical leading and trailing end portions.

37. A vibrator as claimed in claim 36, wherein elongated recesses are formed lengthwise in both said leading and trailing end portions.

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